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AN ECONOMIC ANALYSIS OF MARKET ACCEPTANCE OF PADDY GROWN IN TUNGABHADRA PROJECT AREA

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ABSTRACT

Rice is important food crop of the world. It is the staple food of more than 60 per cent of the world population. Results revealed that, majority of farmers (83.33%) have grown BPT-5204 paddy variety mainly due to its superfine quality and higher yield. Similarly, the biochemical properties like higher starch content (86%), optimum oil (2.70%), N (0.81%) contents in BPT-5204 might have favoured the acceptance of sona masuri by the farmers.

Majority of traders opinioned that, moisture content was first consideration while preferring the paddy varieties in all the selected markets of TBP command area. Apart from moisture content, broken percentage was found to be another important attribute considered by both traders and millers while procuring the produce in different markets. In fact, the price of the paddy/rice produce was reflected by the extent of moisture content and broken percentage of rice in a particular lot of the produce.

The other attributes like colour, foreign matter, spotted grains, etc also contributed in preferring the different varieties of paddy by traders/rice millers. Therefore, it is advised to the farmers that, the paddy produce should be offered for sale only after sufficient drying in the field itself for better market acceptability.

KEYWORDS: Physical, Biochemical Properties, Market Acceptance, Moisture Content

INTRODUCTION

Rice *(Oryza sativa* L.) is an important food crop of the world. It is the staple food of more than 60 per cent of the world population. Rice is mainly produced and consumed in the Asian region. India has the largest area (45.50 million ha) under paddy in the world and ranks second in the production (98.43 mt) after China (Anon, 2011). India has emerged as a major rice consumer.

With the growing world population, paddy production has to be increased to 810 million tonnes by the year 2025 (Anon, 2011). Similarly, Indian rice production has to be stepped up to 140 million tonnes. Increasing the production and productivity of rice with decreasing land and water resources is a herculean task. In Karnataka, the crop is being grown on an area of 1.45 million ha with a production and productivity of 3.72 million tonnes and 2699 kg/ha (Anon, 2011), respectively and the productivity is low when compared with many developed countries. Varieties yielding higher than the present ones should be developed and adopted for commercial cultivation to increase the productivity as the area under the crop cannot be increased continuously.

Rice is primarily a high-energy calorie food. The major part of rice consists of carbohydrate in the form of starch, which is about 72-75 per cent of the total grain composition. The protein content of rice is around 7 per cent. The protein of rice contains glutamine, which is also known as oryzenin. The nutritive value of rice protein (Biological value = 80) is much higher than that of wheat (Biological value = 60) and maize (Biological value = 50) or other cereals. Rice contains most of the minerals mainly located in the pericarp and germ and about 4 percent phosphorus.

Indian Paddy Scenario

Among the rice growing countries, India has the largest area under paddy in the world (45.50 million ha) with a total production of 98.43 million tonnes during 2010-11 (Anon, 2011) and it stood next only to China in the world with respect to production. But, the yield levels in India are low at 2.20 tonnes per ha compared to other major rice producing countries viz., Japan (6.52 t/ha), China (6.24 t/ha) and Indonesia (4.25 t/ha) (Anon, 2010). About 67 per cent of the area under paddy in India is under HYV's.

In India, the highest area under paddy is in Uttar Pradesh (59.20 lakh ha) followed by West Bengal (56.90 lakh ha), Orissa (44.50 lakh ha), Andra Pradesh (39.80 lakh ha) and Karnataka (14.20 lakh ha). Production-wise, West Bengal stands first (147.50 lakh tonnes) followed by Andra Pradesh (118.70 lakh tonnes), Uttar Pradesh (111.20 lakh tonnes) and Karnataka (34.50 lakh tonnes). Highest yield is observed in the state of Punjab (3870 Kg/ha), followed by Assam (3360 Kg/ha) and Karnataka (2464 Kg/ha), (Anon, 2010).

Karnataka is one of the major paddy growing states in India. It is grown in an area of 1.42 million ha with an annual production of 3.45 million tonnes during 2007-08. The area under rice production is increasing over the years. Karnataka ranks fourth in productivity and ninth in production among major rice growing states of the country. The average yield of rice is around 2464 kg/ha. The important rice growing districts of the state are, Haveri, Uttar Kannada, Dharwad, Koppal, Raichur, Mysore and Hassan. Paddy in the state is grown under different agro-climatic (upland, low land and Rained) conditions and the crop is damaged by more than 100 species of insect pests of which about dozen are of significance in India

Status of Rice Milling Units in India

Rice milling is the oldest and the largest agro-processing industry of the country. At present, it has a turnover of more than Rs. 25,500/- crore per annum. It processes about 85 million tonnes of paddy per year and provides staple food grain and other valuable products required by over 60 per cent of the population. Paddy grain is milled either in raw condition or after par boiling, mostly by single hullers. Over 82,000 single hullers are registered in the country. Apart from this, there are also a large number of unregistered single hulling units in the country. A good number (60%) of them are also linked with par-boiling units and sun –drying yards. Most of the tiny hullers of about 250-300 kg/hr capacities are employed for custom milling of paddy. Apart from these, double hulling units numbering over 2,600 units, under run disc shellers cum cone polishers numbering 5,000 units and rubber roll shellers cum friction polishers numbering over 10,000 units are also present in the country. Further, over the years there has been a steady growth of improved rice mills in the country. Most of these have capacities ranging from 2 to 10 tonnes/hr.

Need for Improved Rice Mills

The recovery of whole grains in a traditional rice mill using steel hullers for dehusking is around 52-54 per cent. There is excessive loss in the form of coarse and fine brokens. Loss of large portion of endosperm layers during the

dehusking operation further accentuates the problem. Against it, the recovery percent of whole grains in modern rice mills using rubber roll shellers for dehusking operation is around 62-64 per cent. The whole grain recovery percent further increases to 66-68 per cent in case of milling of parboiled paddy. Thus, it can be seen that there is an overall improvement of recovery of whole grains by about 10-14 per cent if one uses rubber roll shellers for rice milling operations. The conversion ratio (i.e. recovery percentage of various final product and byproduct for every 100 kg feed of raw paddy) for these improved rice mills can be as follows:

- **Per Cent of Milled Rice:** 62-68 per cent
- **Per Cent of Rice Bran:** 4-5 per cent
- **Per Cent of Rice Husk**: 25 per cent
- **Per Cent of Germ Wastages:** 2-8 per cent

Scenario of Paddy Cultivation in TBP Area

- Tungabhadra Project Area (TBP) encompassing Raichur, Bellary and Koppal districts is known as rice bowl of Karnataka with nearly nine lakh hectares under paddy cultivation with an average yield of 4,800 kg/ha.
- According to H.K. Chandramohan, Secretary of the Agricultural Produce Marketing Committee, Establishment of the Rice Technology Park will convert into a major agri-business centre in the State and end the dependence of paddy growers from the region on mills in Tamil Nadu for processing paddy.
- The technology park would have facilities for producing rice flour, rice rave, rice bran oil, noodles, rice-based alcohol, animal and poultry feed and paddy husk used for power generation and brick making.
- Andhra migrated farmers have rich experience in paddy cultivation.
- Several varieties which are not recommended by UAS Raichur or any competent authorities are grown in TBP area.
- Most often, farmers end up with problems in cultivation of these varieties due to bad flowering, seed setting, growth, etc.
- Many a times, the unscrupulous varieties are not preferred by traders and rice millers in one or the other pretext of quality.

Under the circumstances, it is necessary to investigate in detail about the nature and extent of different varieties across the TBP area, their quality parameters, acceptance by the traders\rice millers, etc. Hence, the present study was undertaken in the TBP area of raichur.

METHODOLOGY

Sampling Frame Work

Selection of Paddy Varieties Grown in TBP Area

All major paddy varieties grown by farmers were selected for working quality specifications based on highest area in the variety.

Selection of Traders

Three markets having highest volume of paddy transaction were selected from TBP area. Accordingly, Gangavati, Karatagi and Sindhanur having highest volume of paddy transaction were chosen. From each market, 30 traders were selected at random.

Selection of Rice Millers/Processers

Three markets having highest volume of paddy transaction were selected from TBP area. Accordingly, Gangavati, Karatagi and Sindhanur having highest volume of paddy transaction were chosen. From each market, 10 processers/rice millers based on highest volume of transaction were selected.

Data Collection

The detailed information required for the study was collected from the respondents by personal interview method to ensure that the data made available by them was adequate, comprehensive and reliable

Analytical Tools/Techniques

For the purpose of fulfilling the specific objectives of the study, the data were analyzed by using appropriate tools and techniques.

Garrett's Ranking Technique

In order to analyze the Traders and Processers/ Rice miller's perceptions about different attributes of paddy were ranked by the traders and processers. These ranks were analyzed through Garrett's ranking technique. The attributes of paddy preference by Traders and Processors/Rice millers are depicted in table 1.

Garrett's ranking technique gives the change of orders of constraints into numerical scores. The major advantage of this technique as compared to simple frequency distribution is that here constraints are arranged based on their importance from the point of view of respondents.

Garrett's formula for converting ranks into per cent was given by

$$\textbf{Per Cent position} = 100 * (R_{ij} - 0.5) / N_j$$

Where, R_{ij} = rank given for i th factor (constraint) by j th individual

N_j = Number of factors (constraints) ranked by j th individual

The relative position of each rank obtained from the above formula was converted into scores by referring to the table given by Garrett (transmutation of orders of merit into units of amount or scores) for each factor, scores of all individuals were added and then divided by the total number of respondents for the specific factor (constraint).

Table 1: Attributes Considered for Paddy by Traders and Rice Millers

Attributes			
Sl. No.	**Traders**	**Sl. No.**	**Rice Millers**
1	Moisture content	1	Moisture content
2	Shrivelled and black spotted grains	2	Milling quality
3	Broken percentage	3	Head rice recovery
4	Odour	4	Colour

Table 1: Contd.,			
5	Colour	5	Foreign matter
6	Foreign matter	6	Odour
7	Length & size of grain	7	Bran recovery
8	Price	8	Length and size of grain
		9	Price

RESULTS AND DISCUSSIONS

Socio-Economic Characteristics of Sample Farmers

The general socio-economic features of the sample farmers pertaining to age, type and size of family, educational status, size of farm, farm income, etc are summarized and presented in table 2.

The age of the sample farmers clearly indicated that majority (48.34%) of them were middle aged between 36 to 50 years followed by young farmers (upto35 years) with 31.66 per cent. In case of type of family, a considerable number of (87.50%) sample farmers were nuclear type with less than five members in a family. However, children (53.97%) formed major part of the family followed by male (28.57%) family members and female (17.46) family members, respectively. It is interesting to note that the educational status of sample farmers was very poor with less than 60 per cent either illiterates (35.83%) or primary school (25%) drop outs. It was found that only 8.33 per cent were pre-university course holders and 6.67 per cent degree holders. The average size of the farm of the sample farmers was found to be relatively large with 15.63 acres. It is worth noting that nearly 70 per cent of sample farmers were having less than Rs. 23,125 income per annum per household. It was observed that 43.33 per cent of sample farmers had middle level of income (Rs. 11,375 to Rs. 23,125) followed by 25 per cent farmers of low level income (Rs. <11,375).

Table 2: Socio-Economic Characteristics of Sample Farmers in Study Area (n=120)

Sl. No.	Particulars/Categories	Unit	No. of respondents	Percentage
1	**Age of the Farmer (Years)**			
	a) upto 35	No.	38	31.66
	b) 36-50	No.	58	48.34
	c) >50	No.	24	20
	Total	No.	120	100
2	Type of family			
	a) Joint	No.	15	12.5
	b) Nuclear	No.	105	87.5
	Total	No.	120	100
3	**Family Size**			
	a) Male	No.	1.8	28.57
	b) Female	No.	1.1	17.46
	c) Children	No.	3.4	53.97
	Total	No.	6.3	100
4	**Educational Status of Respondent**			
	a) Illiterates	No.	43	35.85
	b) Primary school	No.	30	25
	c) High school	No.	16	13.33
	d) SSLC	No.	13	10.83
	e) PUC	No.	10	8.33
	f) Degree	No.	8	6.66
	g) Post graduation	No.	__	__
	Total	No.	120	100
5	Size of the farm	Acre	15.6	15.63

Table 2: Contd.,				
6	**Household Income**			
	a) Low (upto Rs. 11,375)	No.	30	25
	b) Middle (Rs. 11,376-Rs. 23,125)	No.	52	43.34
	c) High (>Rs. 23,125)	No.	38	31.66
Total		**No.**	**120**	**100**

Profile of Quality Parameters of Different Paddy Varieties

Distribution of Different Paddy Varieties Grown by Farmers

A perusal of table 3 clearly indicated that majority (83.33%) of farmers were growing BPT-5204 paddy variety, followed by IR-64 (12.50%), Ganga-kaveri (6.00%), MTU1010 (4.10%) and Sujatha (3.33%) respectively in *kharif* season. It is interesting to note that as many as 19 varieties of paddy were grown in *rabi*/summer season in TBP area. That is, except BPT-5204, which is popularly called as *Sona masuri*, all other varieties were grown during *rabi*/summer season. Ganga-kaveri (39.17%) was more popular among farmers for cultivation in *rabi*/summer season, followed by Sujatha (19.17%), Kaveri-sona (15%) and IR-64 (13.33%).

Table 3: Distribution of Paddy Varieties Grown by Farmers in TBP Command Area n=120

Sl. No.	Variety Name	Kharif		*Rabi*/Summer	
		No.	%	No.	%
1	BPT-5204	100	83.33	__	__
2	Kaveri-Sona	__	__	18	15
3	Ankur-Sona	__	__	10	8.33
4	Gangavati-Sona	__	__	8	6.67
5	IR-64	15	12.5	16	13.33
6	Emergency	__	__	8	6.67
7	MTU-1001	__	__	10	8.33
8	MTU-1010	5	4.1	8	6.67
9	Sujatha	4	3.33	23	19.17
10	Ganga-Kaveri	6	5	47	39.17
11	Poineer	__	__	2	1.67
12	Rasi	__	__	1	0.83
13	HMT	__	__	5	4.17
14	JGL-1798	__	__	8	6.67
15	55	__	__	3	2.5
16	Gangavati-Emergency	__	__	1	0.83
17	Gidda-Emergency	__	__	1	0.83
18	Gangavati-Sanna	__	__	2	1.67
19	Ratan sagar	__	__	3	2.5
20	Gangavati-Mallige	__	__	1	0.83
	Total	**120**	**100**	**120**	**100**

Physical Parameters of Different Paddy Varieties Grown by Farmers

The results presented in Table 4 revealed that IR-64 (25.00gm) had highest 1000 seed weight followed by Ganga-kaveri with 23.00gm, Gidda emergency with 19.00gm and Gangavati emergency with 18gm, while Gangavati sanna (12.00gm) had lowest 1000 seed weight. In case of 1000 kernel weight, Ganga-kaveri (14.80gm) had highest 1000 kernel weight followed by Gangavati mallige (14.0gm) and Gangavati emergency (12.7gm), while Gangavati sanna (8.50gm) had lowest 1000 kernel weight. It is important to note that Ratan sagar (76.15%) had highest milling percentage, followed by ARS emergency (73.13%), Gangavati sona (71.33%), Ankur sona (70.55%) and BPT-5204 (69.33%), respectively. Head rice recovery was found to be highest in Gangavati sanna (72%), followed by Ankur sona (70%) and

Gangavati emergency (69%), respectively. Ganga-kaveri (22%) had lowest head rice recovery. The physical quality parameters estimated in different paddy varieties clearly indicated that BPT-5204 (9.0 points) had highest overall acceptability followed by Ankur sona, Gangavati sona (8.75) and ARS emergency (8.50), while IR-64 and Ganga-kaveri (7.0 points) had lowest overall acceptability.

Table 4: Physical Parameters of Different Paddy Varieties Grown by Farmers

Sl. No.	Variety	1000 Seed wt. (gm)	1000 Kernel wt.(gm)	Milling Percentage (%)	Head Rice Recovery (%)	Color of Grain	Size of Grain	Overall Acceptability (9- Point Scale)
1	BPT-5201	15	10.4	69.33	42	Light brown	Short & thin	9
2	Ankur-sona	18	12.7	70.55	50	Brown	Short & thin	8.75
3	Gangavati sona	15	10.7	71.33	56	Light brown	Short &Medium thick	8.75
4	ARS emergency	16	11.7	73.13	56	Off brown	Short & medium thick	8.5
5	JGL-1798	16	9.5	59.37	54	Medium brown	Medium	8
6	Gidda emergency	19	11.1	57.89	46	Dark brown	Short	8
7	Gangavati mergency	18	12.7	65.55	69	Brown	Medium & thick	8
8	Ratan sagar	13	9.9	66.15	40	Off brown	Medium and thick	8
9	Ganga-kaveri	23	14.8	65.21	41	Light brown	Long &thick	7
10	IR-64	25	9.9	66.15	40	Off brown	Medium &bold	7
11	Gangavati mallige	23	14	62.3	21	Light brown	Long &thick	7
12	Gangavati sanna	12	8.5	70.83	72	Light brown	Short & thin	7

Source: ARS, Gangavati

It is clearly evident from the Table 4 that, majority of farmers (83.33%) have grown BPT-5204 paddy variety in *kharif* season in TBP command area mainly due to its superfine quality and higher yield. BPT-5204 which is popularly known as sona masuri, among consumers has better physical parameters resulting in overall acceptability of nine in nine point scale by farmers as compared to other popular varieties in *kharif* season.

Biological Parameters of Different Paddy Varieties Grown by Farmers

A perusal of Table 5 revealed that, IR-64 (1.25%) had highest N content followed by ARS emergency (1.14%) and Ratan sagar (1.13%), respectively, while Gangavati sona (0.63%) had lowest N content. In case of oil content, Gangavati mallige (2.90%) was having highest oil content followed by Ratan sagar (2.80%) and BPT-5204 (2.80%), respectively. On the other, Gangavati sanna (2.10%) had lowest oil content. BPT-5204 (86%) had marginal higher starch content over Ankur sona (54%) and Gangavati sanna (84%). However, starch content was found to be less than 80 per cent in case of Gangavati sona (72%), Gidda emergency (75%), JGL-1798 (76%) and Ratan sagar (78%).

Table 5: Biochemical Properties of Different Paddy Varieties Grown by Farmers

Sl. No.	Variety	N Content (%)	Oil Content (%)	Starch Content (%)
1	BPT-5201	0.81	2.7	86
2	Ankur-Sona	0.71	2.7	84
3	Gangavati sona	0.63	2.6	72
4	ARS emergency	1.14	2.2	81
5	JGL-1798	0.94	2.6	76
6	Gidda emergency	0.83	2.5	75
7	Gangavati emergency	0.8	2.6	82
8	Ratan sagar	1.13	2.8	78
9	Ganga-Kaveri	0.92	2.8	80
10	IR-64	1.25	2.8	78
11	Gangavati mallige	0.91	2.9	81
12	Gangavati sanna	0.75	2.1	84

Similarly, the biochemical properties like higher starch content (86%), optimum oil (2.70%), N (0.81%) contents in BPT-5204 might have favoured the acceptance of sona masuri by the farmers.

Cooking Quality Parameters of Different Paddy Varieties Grown by Farmers

The cooking quality of different paddy varieties (Table 6) estimated in terms of kernel length and breadth before and after cooking, cooked volume and swelling clearly indicated that there was marginal difference in various parameters. However, the cooked volume was found to be higher in IR-64 (455gm) followed by Gidda emergency (365gm), JGL-1798 (360gm), Ankur Sona (356gm), Gangavati sanna (356gm), Ratan sagar (350gm) and Gangavati sona (350gm). In case of swelling after cooking, it was higher in IR-64. Similar pattern was observed in case of swelling after cooking rice in different varieties. In case of kernel length and breadth before and after cooking, IR-64 (104.82%) had higher percent change of kernel length followed by Ratan sagar (102.41%), JGL-1798 (100%) and Ankur sona (100%), respectively. Gangavati emergency (50.94%) had lower percent change. On the other, BPT-5204 (108.33%) had higher percent change of kernel breadth followed by Ankur sona (108.32%) and Ratan sagar (108%), respectively. ARS emergency (32.28%) had lowest percent change of kernel breadth.

Table 6: Cooking Quality Parameters of Different Paddy Varieties Grown by Farmers

Sl. No.	Variety	Kernel Length (mm)			Kernel Breadth (mm)			Cooked Volume (gm/100gm rice)	Expansion Ratio
		Before Cooking	After Cooking	Change (%)	Before Cooking	After Cooking	Change (%)		
1	BPT-5201	4.5	8	77.78	1.2	2.5	108.33	344	3.44
2	Ganga-Kaveri	6	10.5	75	2	3	50	330	3.3
3	JGL-1798	4	8	100	1.37	2.5	82.48	360	3.6
4	Ankur-Sona	4	8	100	1.2	2.5	108.32	356	3.56
5	IR-64	4.15	8.5	104.82	1.62	3.2	97.53	455	4.55
6	Gangavati sona	5	8	60	1.83	3	63.93	350	3.5
7	Gangavati mallige	6	10.5	75	2	3	50	320	3.2
8	Gidda emergency	5	8.5	70	2	3	50	365	3.6
9	Gangavati emergency	5.3	8	50.94	2	3.5	75	328	3.28

Table 6: Contd.,									
10	ARS emergency	5.1	8	56.86	1.89	2.5	32.28	300	3
11	Gangavati sanna	4	7	75	1.2	2.4	100	356	3.56
12	Ratan sagar	4.15	8.4	102.41	1.62	2.99	108	350	3.5

The better cooking quality parameters like higher increase in the kernel breadth, smaller increase in kernel length and swelling might have contributed for popularity of BPT-5204 paddy variety in TBP area. Due to long duration (150 days seed to yield), the BPT-5204 was grown only in *kharif* season and not in *rabi*/summer season since canal closes before March every year.

Pattern of Preferences of Paddy by Traders and Processors/Rice Millers

Pattern of Attributes of Paddy Preference by Traders

The preference of traders for purchase of paddy varieties based on different attributes were assessed by scoring and ranked using Garette ranking and the results are presented in Table 7.

Table 7: Distribution of Attributes of Paddy Preferred by Traders in Different Markets

Sl. No.	Attributes	Sindhanur (n=30)			Karatagi (n=30)			Gangavati (n=30)		
		Total Score	Garrett Score	Rank	Total Score	Garrett Score	Rank	Total Score	Garrett Score	Rank
1	Moisture content	2307	76.9	I	2388	79.6	I	2325	77.5	I
2	Broken percentage	1854	61.8	III	1881	62.7	II	1842	61.4	III
3	Length & size of grain	1048	34.9	VII	1039	34.6	VII	1129	37.6	VII
4	Shriveled and black spotted grains	1701	56.7	IV	1683	56.1	IV	1854	61.8	II
5	Foreign matter	1290	43	VI	1198	39.9	VI	1251	41.7	VI
6	Colour	1307	43.6	V	1413	47.1	V	1301	43.4	V
7	Price	600	20	VIII	647	21.6	VIII	652	21.7	VIII
8	Odour	1872	62.4	II	1872	57.4	III	1616	53.9	IV

A perusal of table 8 clearly revealed that, moisture content (Rank-I) was found to be the most important and first consideration while preferring the paddy in all the markets. Broken percentage (Rank-II) of rice was also found to influence the preference of paddy after the moisture content in Karatagi (Rank-II) and Gangavati (Rank-III) markets. Interestingly, Odour (Rank-II) of the paddy was found to influence the preference of traders in Sindhanur market. Shriveled and black spotted grains, colour, foreign matter were the other major attributes influencing preference of paddy by traders in selected markets of TBP area.

It is clearly evident from the Table 7 that moisture content was found to be the most important and first consideration of traders while preferring the paddy varieties in all the selected markets namely Karatagi, Gangavati and Sindhanur in TBP command area, may be because of higher moisture content would enhance weight loss of paddy grain, increase the incidence storage pests, need to incur additional cost on drying, handling etc. Similar tendency was expressed by the rice millers (Table 8) in all the markets. Apart from moisture content, broken percentage was found to be another important attribute of paddy/rice considered by both traders and rice millers while procuring the produce in different markets of TBP area. In fact, the price of the paddy/rice produce was reflected by the extent of moisture content and

broken percentage of rice in a particular lot of the produce. It is commonly observed that the first step to test the quality of paddy/rice while procuring the produce and determination of its price was to convert the paddy into rice by pressing the produce in two palms and find out the percentage of broken rice. Similarly, of late, majority of the traders as well as rice millers are having moisture meters which are invariably used to find out the moisture content of different lots of paddy produce. About a decade ago, moisture content was determined based on eye sight and weighing the produce by hand-palm.

Pattern of Attributes of Paddy Preference by Rice Millers

The results presented in table 8 revealed that moisture content (Rank-I) was found to be the first consideration in preferring paddy by rice millers similar to that of traders. This was followed by milling percentage (Rank-II) and head rice recovery (Rank-III) in all the selected markets namely Karatagi, Sindhanur and Gangavati. It is interesting note that price factor had the least influence in preferring of paddy by rice millers in all the selected markets of TBP area.

Table 8: Distribution of Attributes of Paddy Preferred by Processers/Rice Miller's Indifferent Markets

Sl. No.	Attributes	Sindhanur (n=10)			Karatagi (n=10)			Gangavati (n=10)		
		Total Score	Mean Score	Rank	Total Score	MEAN SCORE	Rank	Total Score	Mean Score	Rank
1	Milling percentage	719	71.9	II	670	67	II	642	64.2	II
2	Head rice recovery	609	60.9	III	585	58.5	III	566	56.6	IV
3	Length and size of grain	345	34.5	VIII	383	38.3	VII	366	36.6	VII
4	Bran recovery	351	35.1	VII	337	33.7	VIII	336	33.6	VIII
5	Foreign matter	512	51.2	V	494	49.4	V	465	46.5	VI
6	Colour	518	51.8	IV	476	47.6	VI	581	58.1	III
7	Price	190	19	IX	190	19	IX	190	19	IX
8	Moisture content	774	77.4	I	810	81	I	810	81	I
9	Odour	482	48.2	VI	573	57.3	IV	551	55.1	V

The opinion survey of traders/rice millers clearly indicated that the broken percentage of rice was relatively higher in the paddy produced in *rabi*/summer season as compared to *kharif* season. Therefore, most of the BPT-5204 (Sona masuri) paddy variety grown in *kharif* season would be processed as raw while the *rabi*/summer produce processed as steamed rice.

The other attributes like colour, foreign matter, spotted grains, etc also contributed in preferring the different varieties of paddy by traders/rice millers. However, it was expressed by the majority of traders/rice millers that these attributes can be managed with the modern/advanced rice mills having sortex technology.

Therefore, it is advised to the farmers that the paddy produce should be offered for sale only after sufficient drying in the field itself for better market acceptability. Similarly, the broken percentage of rice could be managed with adoption of better and suitable/appropriate nutrient and water management practices.

CONCLUSSIONS

Results revealed that, majority of farmers (83.33%) have grown BPT-5204 paddy variety in *kharif* season in TBP command area mainly due to its superfine quality, higher yield and also biochemical properties. The better cooking quality parameters like higher increase in the kernel breadth, smaller increase in kernel length and swelling might have contributed for popularity of BPT-5204 paddy variety in TBP area. Due to long duration (150 days seed to yield), the BPT-5204 was grown only in *kharif* season and not in *rabi*/summer season since canal closes before March every year.

Majority of traders opinioned that, moisture content was found to be the most important and first consideration while preferring the paddy varieties in all the selected markets of TBP command area, it is may be because of higher moisture content would enhance weight loss of paddy grain, increase the incidence storage pests, need to incur additional cost on drying, handling etc. Similar tendency was expressed by the rice millers in all the markets. Apart from moisture content, broken percentage was found to be another important attribute of paddy/rice considered by both traders and rice millers while procuring the produce in different markets of TBP area. In fact, the price of the paddy/rice produce was reflected by the extent of moisture content and broken percentage of rice in a particular lot of the produce.

The other attributes like colour, foreign matter, spotted grains, etc also contributed in preferring the different varieties of paddy by traders/rice millers. However, it was expressed by the majority of traders/rice millers that these attributes can be managed with the modern/advanced rice mills having sortex technology.

Therefore, it is advised to the farmers that the paddy produce should be offered for sale only after sufficient drying in the field itself for better market acceptability. Similarly, the broken percentage of rice could be managed with adoption of better and suitable/appropriate nutrient and water management practices.

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